

### **REMARKS**

Applicants appreciate the Examiner's thorough consideration provided in the present application. Claims 1-12 are currently pending in the instant application. Claims 2-4 and 10 have been amended. Claims 1-4 and 10 are independent. Claim 12 has been added for the Examiner's consideration. Reconsideration of the present application is earnestly solicited.

Applicants submit that the subject matter of claims 12 is fully supported by the original written description, including, but not limited to, original claims 1, 2 and 6.

### **Allowable Subject Matter**

Applicants appreciate the Examiner's indication of allowable subject matter. Specifically, the subject matter of claims 2-5, 10 and 11 has been indicated as being allowable if rewritten in independent format. Without conceding the propriety of the Examiners' rejections, but merely to expedite the prosecution of the present application, claims 2-4 and 10 have been rewritten in allowable, independent format. Accordingly, as indicated by the Examiner in the Office Action, claims 2-5 and 7-12 should be allowed. As discussed in greater detail hereinafter, Applicants submit that the remaining claims of the

present application should also be allowed and the present application should be permitted to issue.

### **Claim Rejections Under 35 U.S.C. § 103**

Claims 1 and 6-9 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanaka (U.S. Patent No. 5,744,831) in view of Kon (U.S. Patent No. 4,688,098). This rejection is respectfully traversed.

In light of the foregoing amendments to the claims, Applicants respectfully submit that all of the rejections have been obviated and/or rendered moot. Accordingly, these rejections should be withdrawn and the present application should be passed to Issue.

Applicants submit that the prior art of record fails to teach or suggest each and every element of the unique combination of elements of the claimed invention. Accordingly, this rejection should be withdrawn. For example, the prior art of record fails to teach or suggest the unique combination of elements of the claimed invention of claim 1, including the feature(s) of: "a channel stopper provided between the adjacent vertical transfer paths and formed by an insulating layer having a trench structure, *wherein a conductive substance to which a predetermined voltage is applied is buried in the insulating layer and an*

*oxide film is formed between the conductive substance and the adjacent vertical transfer paths.*" (emphasis added) Accordingly, this rejection should be withdrawn.

Applicants submit that the references relied upon by the Examiner in this rejection do not teach or suggest the above-identified features. Further, Applicants submit that it would not have been obvious to one of ordinary skill in the art to modify the Tanaka reference with the alleged teachings of Kon et al. as advanced by the Examiner. Accordingly, this rejection is improper and should be withdrawn.

The Examiner has alleged that Tanaka and Kon et al. are related to each other in that each reference is directed at a solid state image sensor or device (see pages 2-3, paragraph 3 of the Office Action). However, the Examiner will note that the Kon et al. reference appears to be directed toward a solid-state image device that is intended for a frame transfer type CCD. In contrast, Tanaka is directed at an interline transfer type CCD. In Tanaka, the described interline transfer type CCD relies upon an optical-electronic converted signal output which is sequentially output to the adjacent vertical CCD register. In contrast, the claimed invention utilizes the CCD format of the frame transfer

type in which the received O-E signal is stored directly into the vertical transfer path. Similarly, Kon et al. appears to be a CCD of the frame transfer type.

Applicants submit that one of ordinary skill in the art would not have modified the interline transfer type CCD of Tanaka to only include limited portions of the structure of the frame transfer type CCD of Kon et al. For example, the Examiner has indicated that Kon et al. describe an "image sensor with means for removing excess photocharges where in Fig. 1, electrodes 4 and 5 are buried inside insulating layer 7." The Examiner further indicates that it would have been obvious to "include the buried electrodes inside the insulating layer in Tanaka as taught by Kon et al. in order to have an image pick up device with higher reliability and performance." (see page 3, paragraph 3 of the Office Action) However, Applicants respectfully submit that neither of these references relied upon by the Examiner explicitly or implicitly suggest that burying electrodes inside the insulating layer of an interline transfer type CCD would result in an image pickup device with higher reliability and performance. Accordingly, Applicants submit that this rejection should be withdrawn.

As to the dependent claims, Applicants respectfully submit that these claims are allowable due to their dependence upon an allowable independent claim, as well as for additional limitations provided by these claims.

### **CONCLUSION**

Since the remaining references cited by the Examiner have not been utilized to reject the claims, but merely to show the state-of- the-art, no further comments are deemed necessary with respect thereto.

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.


In the event there are any matters remaining in this application, the Examiner is invited to contact Matthew T. Shanley, Registration No. 47,074 at (703) 205-8000 in the Washington, D.C. area.

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Appl. No.: 10/615,904  
Art Unit: 2826  
Amendment dated September 30, 2004  
Reply to Office Action of June 30, 2004  
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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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